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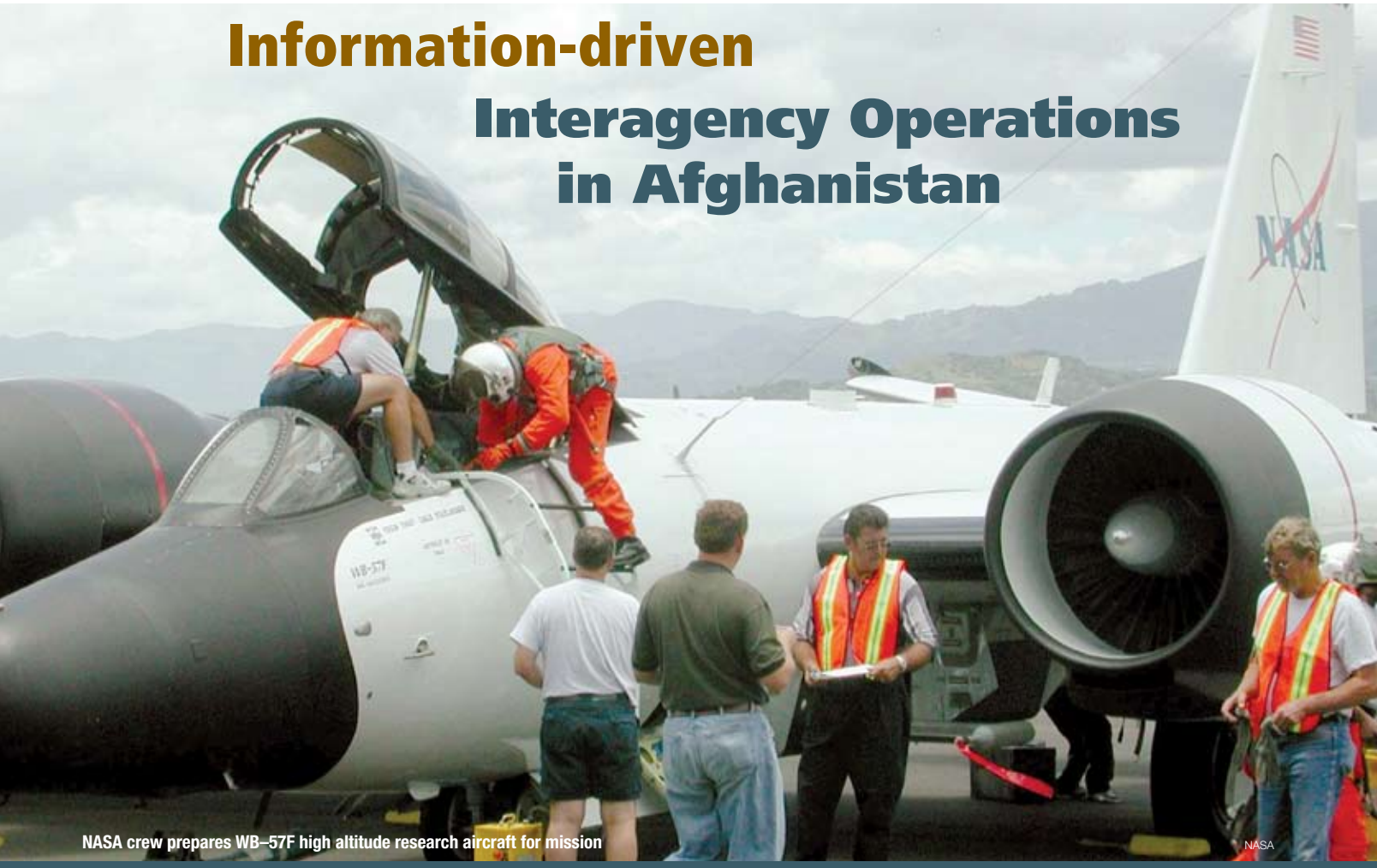
Information-driven Interagency Operations in Afghanistan



NASA crew prepares WB–57F high altitude research aircraft for mission

NASA

By SHANNON O'HARREN, TRUDE V.V. KING, TUSHAR SUTHAR, *and* KENNETH D. COCKRELL

▲ *Download as computer wallpaper at ndupress.ndu.edu*

At the request of Afghanistan's President Hamid Karzai, a team of civilian, military, and coalition scientists, engineers, and support personnel has been collecting hyperspectral data over Afghanistan for the past 2 years. The team includes scientists from the U.S. Geological Survey (USGS), aircrew and support personnel from the National Aeronautics and Space Administration (NASA) WB–57 program, U.S. military logistics and support personnel, and participants from private sector information technology companies from Australia and the United States. Partially funded by the government of Afghanistan, scientists are using this hyperspectral data to assess the country's natural resources. The data promise to identify new sources of revenue and generate jobs for the people of Afghanistan. Scientists leading the effort believe the data should accelerate the development of infrastructure within the country.

Although the mission—named High Altitude Observatory (HALO) Falcon—did not originate as a U.S. Central Command (USCENTCOM) theater security cooperation initiative, it evolved into a military-supported and mutually beneficial operation as a result of close interagency collaboration.

After securing high-level USGS, Office of the Secretary of Defense (OSD), and NASA support to fulfill the host nation's request, OSD and NASA principals contacted USCENTCOM and its air component, Air Forces Central (AFCENT), in an effort to coordinate support, including aircraft beddown, logistics, and NASA flight operations in an environment heavily populated by military aircraft. During this process, several general officers from USCENTCOM and AFCENT were briefed on the mission and the corresponding request from the government of Afghanistan. While briefing the deputy combined forces air component commander, it became clear that AFCENT was seeking additional opportunities to demonstrate how airpower could support strategic objectives in the region. The USGS-led NASA WB–57 geophysical mapping mission offered just such an opportunity.

USGS is a recognized leader in the field of imaging spectroscopy and thereby served as the lead agency for the operation.

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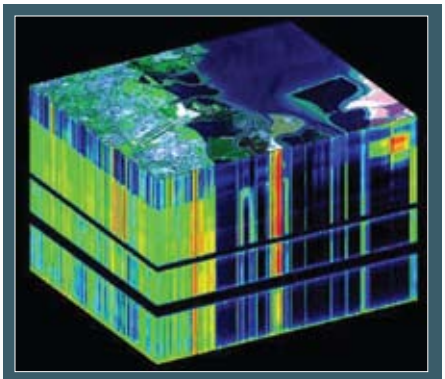


Image highlighting concept of hyperspectral data. Surface spatial data are contained in x-y axes, and compositional information is derived from spectra in z axis.

This expertise is instrumental in acquiring hyperspectral data used in resource (for example, gold, copper, and iron ore) and hazard assessments. In light of the strategic importance of this mission and the lengthy logistic tail necessary to support operations in Afghanistan, the effort was cosponsored by the Department of State and Department of Defense (DOD) and officially led by USGS. Through the cooperation of these departments, and enabled by newly implemented Presidential directives and DOD policies, the team was able to begin initial work in defining its mission and objectives. Through this process, it was determined that NASA aircrew would fly the WB–57 out of Kandahar, Afghanistan, in support of this operation.

USGS Impact

While this article is not about hyperspectral imaging per se, a brief explanation of this USGS capability is contextually important. USGS personnel (principally research geophysicists and accomplished field geologists) bring to bear a wealth of knowledge and experience in tackling complex issues, ranging from geologic hazard analysis (that is, identification of fault lines and flood zones) to chemical residue analysis of contaminated water. This broad expertise has provided insights into many complex challenges confronting the government of Afghanistan, particularly the Ministry of Mining, and Provincial Reconstruction Teams (PRTs) for use in the rebuilding efforts.

PRTs are an effective engagement tool employed by senior U.S. military leaders to work with local Afghans to assist with what are often basic human needs. Across the country, teams are engaged with villagers and tribal leaders to accomplish small yet significant infrastructure projects such as roads, schools, water, and medical facilities. U.S. military personnel, aided by USGS scientists, can use hyperspectral imagery to highlight and assess features in and around a village to determine, for example, soil suitability for crops and construction projects such as small bridges spanning waterways. Hyperspectral data can also aid in determining locations that might be prone to flooding while enabling geologists to anticipate areas that might be at greater risk for catastrophic damage due to earthquakes and landslides. From a financial perspective, hyperspectral data and the information derived from it can potentially translate into billions of dollars for an ailing economy in the form of mining contracts, royalties, and thousands of jobs as new industries are created.

U.S. Geological Survey personnel bring a wealth of knowledge and experience in tackling issues, ranging from geologic hazard analysis to chemical residue analysis of contaminated water

Using advanced technologies and the principles of spectroscopy, USGS scientists are able to characterize the unique chemical makeup of surface geologic features. By analyzing the signature of reflected light from the surface of the Earth, scientists can determine the chemical composition. In other words, hyperspectral data can help determine, for instance, whether imaged surface geologic features are related to processes that may have formed enrichment zones of elements, such as copper, magnesium, iron, or related elements. Such zones may be suitable for mineral exploration and development. This data can also aid scientists in determining healthy or distressed vegetation and can help assess quality in large bodies of water that may contain high levels of pollutants or sediments. Over the last 2 years, nearly 20 terabytes of hyperspectral data have been collected by USGS scientists in Afghanistan.

Government Directives

In December 2005, to assist countries in progressing toward the development of peaceful societies, democratic institutions, and market economies, the President of the United States issued National Security Presidential Directive (NSPD) 44, which outlines management of interagency efforts concerning reconstruction and stabilization. Specifically, the directive seeks to "promote the security of the United States through improved coordination, planning and implementation for reconstruction and stabilization assistance for foreign states and regions at risk of, in, or in transition from conflict or civil strife."[1] The Secretary of State was appointed as lead for coordinating and harmonizing all U.S. Government efforts to prepare, plan for, and conduct stabilization and reconstruction activities. Just prior to the release of NSPD 44, DOD released Directive 3000.05, "Military Support for Stability, Security, Transition and Reconstruction Operations." According to this directive, "stability operations are a core U.S. military mission that the Department of Defense shall be prepared to conduct and support." The directive also states that stability operations "shall be given priority comparable to combat operations and be explicitly addressed and integrated across all DOD activities."[2]

Stability operations are "military or civilian activities conducted across the spectrum from peace to conflict to establish or maintain order in States and regions."[3] Section 4.3.2 of the directive outlines one such activity that underscores the economic focus of the USGS-led data collection activities. As it applies to HALO Falcon, the directive states that DOD policy is to "revive or build the private sector, including encouraging citizen-driven bottom-up economic activity and constructing necessary infrastructure."[4] To reaffirm its partnership with the United States in its efforts to assist them, the government of Afghanistan contributed nearly US$9 million to help finance HALO Falcon data collection efforts.

Interagency Cooperation

Miemie Winn Byrd states that:

the U.S. military alone does not have the skills or resources to create sustainable socioeconomic development. This type of

operation requires an extensive network of stakeholders: the host-nation government (including the military), local populace, international organizations, nongovernmental organizations, private sector, academia, and the U.S. Government (including the military). To attract all the necessary stakeholders, we need to activate the interagency process because the core competency needed for this phase lies in other Federal agencies.[5]

It is this cooperation toward integrated operations that we must support. Similarly, in their article "Forging Provincial Reconstruction Teams," Russel Honoré and David Boslego highlight some insights learned through the implementation of PRTs in Afghanistan. Among them is the lesson that "integrating services and components at the tactical level vastly expands capabilities."[6] They conclude that "seamless integration of all national resources" is a requirement for current and future wars.[7] HALO Falcon is an excellent example of civilian agencies working with the military to enhance diplomatic, informational, and economic relations to aid in stabilization operations.

When American assistance can provide aid to friends and allies around the world who are at risk or have suffered from humanitarian crises, DOD, due to its logistic and security acumen, is often among the first engagement options considered by national leadership. However, as conditions permit, nonmilitary assistance and engagement projects strengthen governmental and institutional relationships for diplomatic, informational, economic, and humanitarian needs. Through theater security cooperation programs, combatant commanders facilitate the integration of many aspects of our national power.

Broader Implications

Whether partnering, collaborating, synchronizing, or harmonizing operations with the military and other U.S. agencies and departments, there is a role for information-driven interagency operations in promoting U.S. national interests. That role should be evaluated by the geographic combatant commands in cooperation with senior staff at our Embassies (that is, economic officers and members of the Country Team), along with members from the Department of State, U.S. Agency for International Development, and USGS, as well as nongovernmental organizations and the private sector. As Franklin Kramer, Larry Wentz, and Stuart Starr suggest in their study *I-Power: The Information Revolution and Stability Operations*, "information and information technologies can significantly increase the likelihood of success in stability operations."[8] Moreover, they go on to explain that successful intervention is incumbent upon "a strategy that coordinates the actions of outside intervenors and focuses on generating effective results for the host nation."[9] The information collected through HALO Falcon represents real power in the form of revenue and growth of new sectors based on the knowledge of previously unknown natural resources. If used effectively, this information can ultimately yield jobs and a higher quality of life for thousands of Afghans.

HALO Falcon is an example of civilian agencies working with the military to enhance diplomatic, informational, and economic relations in stabilization operations

The lessons learned from HALO Falcon serve as a guide for future engagement in countries at risk or in need of U.S. assistance. With a broader understanding of the significance that information plays in today's world, it becomes clear that interagency cooperation across government, coupled with stakeholders from academia and the private sector, can facilitate engagement and potentially economic stimulation of a host nation through stability operations, while simultaneously advancing U.S. national security interests. **JFQ**

NOTES

[1] National Security Presidential Directive 44, *Management of Interagency Efforts Concerning Reconstruction and Stabilization* (Washington, DC: The White House, December 2005).

[2] DOD Directive 3000.05, "Military Support for Stability, Security, Transition and Reconstruction (SSTR) Operations," November 2005.

[3] Ibid.

[4] Ibid.

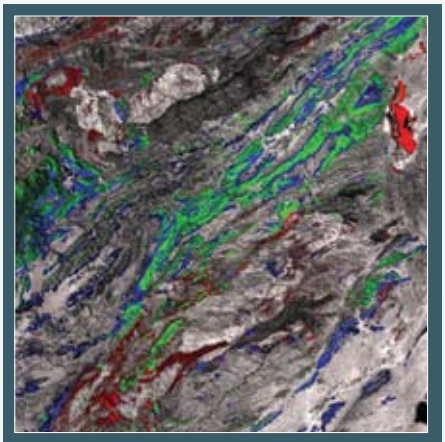
[5] Miemie Winn Byrd, "Combating Terrorism with Socioeconomics," *Joint Force Quarterly* 46 (3d Quarter 2007), 127–130.

[6] Russel L. Honoré and David V. Boslego, "Forging Provincial Reconstruction Teams," *Joint Force Quarterly* 44 (1st Quarter 2007), 85–89.

[7] Ibid.

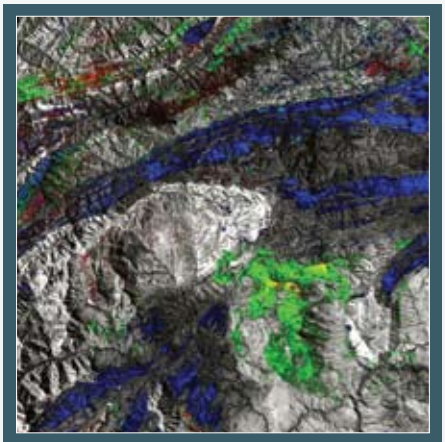
[8] Franklin D. Kramer, Larry Wentz, and Stuart Starr, *I-Power: The Information Revolution and Stability Operations*, Defense Horizons 55 (Washington, DC: National Defense University Press, February 2007).

[9] Ibid.



Preliminary Alteration map using 2007 HYMAP Data portions of Block B, Afghanistan

U.S. Geological Survey



Preliminary Alteration map using 2007 HYMAP Data near Khesraw, Afghanistan

U.S. Geological Survey